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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/064,549

07/25/2002

Harry Israel Ringermacher

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
PATENT DOCKET RM. BLDG. K1-4A59
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EXAMINER

KALIVODA, CHRISTOPHER M

ART UNIT

PAPER NUMBER

2883

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/064,549	Applicant(s) RINGERMACHER ET AL.	
	Examiner Christopher M. Kalivoda	Art Unit 2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Amendment received 08/30/2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,8-15,17-39 and 41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8 is/are allowed.
- 6) ☒ Claim(s) 1,3,4, 9-15, 18-39 and 41 is/are rejected.
- 7) ☒ Claim(s) 17 and 31 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.


Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 July 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received


Brian Healy
Primary Examiner

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>09/16/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, filed August 30, 2004, with respect to the rejection(s) of claim(s) 1-41 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Izumi, U.S. Patent 6,717,152.

Claim Objections

2. Claim 31 is objected to because of the following informalities: The claim references "flexible imager" in line 7 but there is no prior reference to "flexible". Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3, 4, 9-15, 18-20, 22-27, 39 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Izumi, U.S. Patent 6,717,152. Regarding independent claims 1 and 15, Izumi teaches an imager for imaging a subject illuminated by incident radiation comprising a substrate comprising an organic polymer (col 6, lines 63-65 and col 7, line 37-42) and being about three (3) mils to about eight (8) mils

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thickness (col 9, lines 55-56). As noted in the preceding column and line numbers, the substrate is made of a resin and the resin can be polyimide, which is an organic polymer. Izumi also uses a substrate thickness between .1 and .7 mm, some values of which fall in the claimed ranges since 1 mil = 0.0254 mm and the claimed 3-8 mils equates to 0.0762-0.2032 mm.

Furthermore, there is a photosensor array disposed on the substrate comprising a plurality of photosensors (col 6, lines 1-6) and an addressable TFT array comprising a plurality of TFTs (Fig 1, ref sign 4), said photosensors are arranged to form a plurality of columns and at least one row (col 6, lines 1-6), and each of the TFTs are coupled to a respective one of the photosensors (Fig 1) so as to selectively address respective photosensors in the photosensor array (col 6, lines 56-62). The TFTs are addressable since the TFTs are driven in a sequential manner.

There can also be a scintillator (col 1, lines 32-39). While the reference focuses on a direct converting system, it does fall into the two classes and could include a scintillator which is contemplated by the inventor, the scintillator would be disposed so as to receive and absorb incident radiation, configured to convert the incident radiation into optical photons and optically coupled to the photosensor array wherein said photosensor array is configured to receive the optical photons and to generate an electrical signal corresponding to the optical photons (col 1, lines 35-39).

Regarding independent claim 39, in addition to the above, each of the photosensors is orientated at a predetermined angle relative to an adjacent one of the photosensors, for alignment with the incident radiation (col 10, line 60 - col 11, line 5)

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and wherein the substrate and linear photosensor array are arranged in a fixed configuration (see Fig 4) since the detector is curved.

Regarding independent claim 24, Izumi teaches a digital imaging method (col 4, lines 22-25) for imaging a subject comprising conforming a digital imager to the subject (col 11, lines 40-42 and Fig 5, ref sign 60), the subject (Fig 5, ref sign 23) being positioned between the digital imager (Fig 5, ref sign 60) and a radiation source (Fig 5, ref sign 24), activating the radiation source and collecting an image with the digital imager (col 11, lines 7-15).

Regarding claims 3 and 4, the substrate comprises an organic polymer, which is polyimide as described above.

Regarding claims 9, 11, 20 and 22, in addition to the above, each TFT comprises a gate electrode (Fig 1, ref sign 4 since TFTs are used), semiconductive region over the gate electrode (Fig 1, ref sign 1), and a source electrode (Fig 1, ref sign 4 since TFTs are used) and a drain electrode (Fig 1, ref sign 4 since TFTs are used) in contact with and over the semiconductive region and the semiconductive regions comprises a-Si (col 6, lines 8-10). a-Si is organic.

Regarding claim 10, the addressable TFT array is situated between the substrate and plurality of photosensors wherein each photosensor comprises a-Si photodiode (col 1, lines 35-39) if a scintillator is used (col 1, lines 35-39). There can also be a coating layer between the substrate and addressable TFT array (col 6, lines 26-40). While the cover layer over the scintillator is not specifically mentioned, if a scintillator was

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included, there could also be a cover for the purpose of filtering. The photosensor can also comprise a-Si photodiode (col 1, lines 35-39 and col 6, lines 8-10).

Regarding claims 12 and 23, in addition to the above, the semiconductive region is disposed over the source and drain electrodes (Fig 1, ref sign 1 and 4) and the photosensors would be between the substrate and TFT array with the TFTs being transparent if a scintillator is used (col 1, lines 35-39).

Regarding claims 13 and 14, while the inventor only contemplates a scintillator as described above, the use of Cesium Iodide and phosphor is well known for use in scintillators (see U.S. Patent 4,288,264 to Haque, col 3, lines 56-60 as an example).

Regarding claims 18, 19, 25 and 26 the photosensors can be arranged to form one row or a plurality of rows since an array is contemplated (col 6, lines 1-6).

Regarding claim 27, the source is an X-ray source (col 11, lines 7-11).

Regarding claim 41, the photosensor array and substrate can be configured to be adjustable (col 11, lines 40-42) for arranging each of the photosensors at a predetermined angle relative to an adjacent one of the photosensors since the imager can be adjusted into any shape including an arc (see Fig 5, ref sign 6).

5. Claims 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Izumi, U.S. Patent 6,717,152 in view of Sorenson, U.S. Patent 6,636,581. Regarding claims 28-30, Izumi teaches the limitations as described above. Although Izumi teaches that detector can be made into any arbitrary shape (col 11, lines 40-42), the inventor is

silent with respect to using the device to image a portion of an airplane, wrapping the detector around the fuselage or wing.

Sorenson teaches that x-ray inspection of aging aircraft would provide superior detection of cracks (col 1, lines 33-35).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to conform the detector to an aircraft fuselage and wing and obtain an image since Sorenson teaches that x-ray imaging for crack detection is superior and the panels and insulation would not have to be removed (col 1, lines 35-37).

6. Claims 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Izumi, U.S. Patent 6,717,152 in view of Albagli, et al., U.S. Patent 6,031,234.

Regarding independent claim 31, Izumi teaches a digital imaging method (col 4, lines 22-25) comprising bending a digital imager (Fig 5, ref sign 60) comprising a scintillator, positioning the imager such that the subject (Fig 5, ref sign 23) is between the radiation source (Fig 5, ref sign 24) and the flexible imager (Fig 5, ref sign 60), activating the radiation source and collecting an image with the digital imager (col 11, lines 7-15).

While the reference focuses on direct conversion system, there can also be a scintillator (col 1, lines 35-39).

However, the reference is silent with respect to a scintillator with a columnar structure and aligning the columnar structure parallel to the diverging radiation.

Albagli et al. describe a scintillator with a columnar structure (col 4, lines 55-57 and Fig 2, ref sign 155).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Izumi to include scintillator with the columnar structure of Albagli et al. and align the columnar structure parallel to the diverging radiation for the purpose of having a fraction of the optical photons exit the scintillator surface within the desired focal area (col 4, lines 43-48).

Regarding claim 32, the distance between the source and imager is adjusted since a vertical incidence is preferred (col 10, lines 60-67).

7. Claims 33-36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Izumi, U.S. Patent 6,717,152 in view of Sorenson, U.S. Patent 6,636,581. Regarding independent claim 33, Izumi teaches a digital imaging method (col 4, lines 22-25) for imaging a subject comprising activating a radiation source to expose the subject to a diverging radiation beam (col 11, lines 7-15 and Fig 5, arrows emanating from source), a portion of the subject (Fig 5, ref sign 23) being positioned between the radiation source (Fig 5, ref sign 24) and the digital imager (Fig 5, ref sign 60), and collecting an image with the digital imager (col 11, lines 7-15).

Although Izumi teaches that detector can be made into any arbitrary shape (col 11, lines 40-42), the reference is silent with respect to embedding the imager in the subject.

Sorenson teaches that x-ray inspection of a subject such as aging aircraft would provide superior detection of cracks (col 1, lines 33-35).

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Therefore, it would have been obvious to one skilled in the art at the time the invention was made to embed the imager in a subject (such as an airplane fuselage or wing) and obtain an image since Sorenson teaches that x-ray imaging for crack detection is superior and the panels and insulation would not have to be removed (col 1, lines 35-37 and line 39).

Regarding claims 34-36, the subject is section of an aircraft (Fig 1, ref sign 60) and the imager would be embedded between the fuselage and insulation or within a wing (col 1, lines 35-39).

8. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Izumi, U.S. Patent 6,717,152 in view of Foster et al., U.S. Patent 3,775,612. Regarding claim 37, Izumi teaches a digital imaging method (col 4, lines 22-25) for imaging a subject comprising activating a radiation source to expose the subject to a diverging radiation beam (col 11, lines 7-15 and Fig 5, arrows emanating from source), a portion of the subject (Fig 5, ref sign 23) being positioned between the radiation source (Fig 5, ref sign 24) and the digital imager (Fig 5, ref sign 60), and collecting an image with the digital imager (col 11, lines 7-15).

Although Izumi teaches that detector can be made into any arbitrary shape (col 11, lines 40-42), the reference is silent with respect to embedding the imager in the subject.

Foster et al. teaches the use of x-ray imaging to inspect pipe welds (abstract, line 1).

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Therefore, it would have been obvious to one skilled in the art at the time the invention was made to embed the imager in a pipe for the purpose of examining welds to identify cracks.

9. Regarding claim 38, Izumi in view of Sorenson teach the limitations as described above. However, the reference is silent with respect to using a plurality of imagers.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a plurality of imagers, since it has been upheld that mere duplication of the essential working parts in a device involves only routine skill in the art (St Regis Paper v Bemis Co., 193 USPQ 8.) for the purpose of imaging a large area found on airplanes.

Allowable Subject Matter

10. Claim 8 is allowed.

11. The following is an examiner's statement of reasons for allowance:

Regarding independent claim 8, a review of prior art failed to make obvious, disclose or fairly suggest an imager for imaging a subject illuminated by incident irradiation comprising a back surface layer disposed on the back surface of the substrate wherein the back surface layer comprises a plurality of heating elements in addition to the accompanying features of the claim.

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12. Claim 17 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Regarding claim 17, a review of prior art failed to make obvious, disclose or fairly suggest an imager for imaging a subject illuminated by incident irradiation comprising a back surface layer disposed on the back surface of the substrate wherein the back surface layer comprises a plurality of heating elements in addition to the accompanying features of the claim.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Kalivoda whose telephone number is (571) 272-2476. The examiner can normally be reached on Monday - Friday (8:30 - 5:00).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


cmk



Brian Healy
Primary Examiner